THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR STEEL TREATING

Volume II | Entered as Second Class Matter, July 26, 1930 at the Post Office at Cleveland, O., under the Act of March 3, 1879 | June, 1931 | No. 6

THE LIBRARY JUN 3 2 1931

BOSTON SHOW SPACE ALREADY 75% SOLD

Sixty Papers of the Highest Type Offered for Program

Three months and a few days from now Boston will be the hub of the metal world.

National Metal Congress and National Metal Exposition will be in full swing there from Sept. 21 to 25, and thousands of metal men from all over the country, as well as many from abroad, will be there to attend the year's greatest educational event in the field of metal manufacture and fabrication.

Already about 75% of the space in the Exposition has been reserved by 175 firms and a capacity show is certain. Commonwealth Pier, home of the 1924 Exposition, will again house the exhibits.

Sixty papers of the highest type have been arranged for the nine technical sessions sponsored by the A.S.S.T. as part of the National Metal Congress. This number is the largest yet offered for presentation at a convention.

The A.S.S.T. program calls for a morning session devoted to the annual business meeting and the presentation of the Campbell Memorial Lecture, one session arranged by the Recommended Practice Committee to discuss melting problems. Another session to sheet steel, a third to stainless and corrosion-

Continued on Page Four

GROSSMANN VISITS WASHINGTON-BALTO.

Chapter is Host to Advisory Committee Metallurgists

By Leo J. Waldron

The last meeting of the Washington-Baltimore chapter was held in Washington on May 19, at which time the local group was host to the visiting metallurgists in attendance at the Advisory Committee meetings at the Bureau of Standards. The usual informal dinner in honor of the speaker was followed by the lecture of the evening at the New National Museum.

The chairman, Mr. Rawdon, presented our good friend Bill Eisenman who spoke a few words regarding A.S.S.T. activities. On behalf of the local group, Mr. Eisenman presented the retiring chairman, Mr. Rawdon, with an engraved gavel in appreciation of his efforts in guiding the chapter through the past year. Our new chairman, Mr. Dietrich of Baltimore, was introduced to the group and gave a short outline of what will be carried out during the following year. Director Coleman of the National Society then spoke a few words regarding the Society, particularly the publications activities.

At the May meeting of the chapter it is customary to have some man of national metallurgical repute, formerly a member of the local group, as the guest speaker. On this particular occasion we were honored in having Dr. Marcus A. Grossmann of the Republic Research Corp., address us on "Nitriding."

He covered mill operations, compositions of steels used, influence of added elements to the steel, proper heat treatment preceding nitriding, and the duplex process of ammonia treatment that is used.

Nitralloy is finding a variety of uses particularly in those fields where valves, shafts, cams, and piston pins are used. The low strength of its core together with its inability to withstand high impacts somewhat limits its applications. The cost has materially decreased since the original introduction of the process, and, of course, varies over wide limits depending on the size and number of parts to be nitrided.

Dr. Grossmann's lecture was illustrated with many slides. The following discussion gave an idea of the member's interest in the subject.

This meeting marks the close of another successful season for the Washington-Baltimore chapter.

Where A. S. S. T. Headquarters Will Be

Hotel Statler in Boston will be official headquarters of the A.S.S.T. during the Convention, Sept. 21 to 25

E. E. THUM TALKS AT DETROIT'S MEETING

"Metal Progress" Editor Tells About Materials Testing

By O. W. McMullan

A joint meeting of the Detroit chapters of the A.S.S.T. and A.S.T.M. was held on May 11th. The dinner was followed by a short talk by Harvey Campbell, vice president and secretary of the Detroit Board of Commerce, on the early days of the automobile industry. Two national officers of the A.S.S.T., J. M. Watson and W. H. Eisenman, were present.

The technical speaker was E. E. Thum, editor of *Metal Progress*, and his subject was, "The Testing of Engineering Materials." F. O. Clements, technical director of General Motors Research Laboratories and president-elect of the A.S.T.M., acted as technical chairman. Mr. Thum stressed the difference of viewpoint as being a cause of the difference of methods, requirements, and interpretation of results from tests. The manufacturer considers certain material as an end product while the purchaser of steel considers the same product as raw material.

Tests were divided into acceptance or serviceability tests. The former are mostly for uniformity or identification checks, such as chemical analyses, hardness tests, tensile tests, etc. Designers should be interested in the proportional elastic limit but since the yield point can be obtained on the run on the tensile machine, the latter is most frequently used and large factors of safety employed to make up for lack of accuracy. The elastic limit, however, depends to a considerable extent upon the sensitivity of the extensometer. A shorter test known as proof testing is used, chiefly in England, which consists of determining the strain under a small

Continued on Page Two

ST. LOUIS HEARS LINCOLN

Chapter Learns of New Welding Method at Season's Last Technical Meeting

By W. I. Potteiger

The St. Louis chapter of the American Society for Steel Treating held its 9th regular meeting for the year 1930-1931, on May 15 at the American Hotel Annex.

The speaker of the evening was J. C. Lincoln, vice president of the Lincoln Electric Co., Cleveland, O., who gave an interesting talk on shielded arc, the new development in welding, to about 75 members and guests of the chapter. A goodly number of members of the St. Louis Society for Welding were in attendance and the address was very well received.

The St. Louis chapter will hold its annual outing and picnic on June 6 at Persimmon Grove, two miles east of Mitchell, Ill., and we expect to have our usual good time.

DAYTON HEARS OF TANTALUM CARBIDE

F. C. Kelly Tells Chapter of New Steel Cutting Material

By R. R. Kennedy

The May meeting of the Dayton chapter was held on May 18, 1931. The meeting was preceded by a dinner.

An interesting coffee talk on the subject of "Furnace Brick and Refractories" was presented by M. C. Booze, vice president of the Chas. Taylor Sons Co. Mr. Booze spoke of the progress which has been made in the manufacture of refractories in recent years. He stated that fire brick is now burned at higher temperatures than formerly, thus giving a harder brick with greater hot rigidity and a lower shrinkage.

The main event of the evening was a talk by Floyd C. Kelley, research metallurgist of the General Electric Co. on the subject of "Cemented Tantalum Carbide." Mr. Kelley sketched the development of this new tool material and gave the results of numerous cutting tests run on cemented tantalum carbide tools.

Tantalum carbide has a hardness between 9 and 10 on Moh's scale and a melting point above 3800°C. In manufacturing the carbide, pure metallic tantalum in the form of a fine powder is mixed with sufficient carbon to form tantalum carbide and heated in a hydrogen furnace for 5 to 8 hours.

This carbide is then ground to pass a 325 mesh sieve, after which it is thoroughly mixed with a finely powdered metallic binder. Iron, cobalt and nickel have been successfully used as binders. The well mixed powder is pressed into rods and sintered into a solid mass.

Tools are made by copper brazing pieces of cemented tantalum carbide to steel shanks. The tools can be ground on ordinary grinding wheels and take a keen edge. Lapping or stoning of the tools after grinding is unnecessary.

Cutting tests show that for many purposes, such as cutting nickel steel, cemented tantalum carbide is superior even to cemented tungsten carbide. Tools of cemented tantalum carbide cut faster, held up longer and both the chip and the tools were cooler than when cemented tungsten carbide tools were used.

GAS COURSE OPENS JUNE 15

Illinois Gas Association Sponsors a Week's Course in Gas Engineering

The sixth annual short course in gas engineering will open on June 15 at the University of Illinois, Urbana, and will continue throughout the week. The course is sponsored by the Illinois Gas Association and will be conducted by Dr. D. B. Keyes. Geo. A. Uhlmeyer is chairman of the Gas Association committee in charge of arrangements.

The course includes 15 lectures by prominent engineers and will conclude with examinations in various phases.

FIVE EASTERN CHAPTERS HAVE SUCCESSFUL JOINT MEETING IN PHILADELPHIA, MAY 15

Five Hundred Present for Technical Sessions and Plant Visit; Dinner in Evening Climaxes Big Day

Five chapters—Lehigh Valley, New Jersey, ew York, Philadelphia and York—gathered in Philadelphia on May 15 for the Third Annual Eastern Chapters' Group Meeting. About five hundred were present. Elaborate preparations had been made at the Penn Athletic Club to register the guests. When the excitement and confusion of arrival had abated somewhat, the technical session got under way at approximately 10:30 in the morning.

Dr. Henry C. Boynton, vice chairman of the Philadelphia chapter, was in the chair, in the absence of the chairman, Gustaf Peterson, who was confined to his home because of illness. Dr. Boynton welcomed the visitors from other cities and introduced the speakers of the morning—Dr. F. C. Langenberg and S. B. Clark who delivered a paper on "The Centrifugal Process for Making Cast Iron Pipe." Both speakers are with the United States Pipe and Foundry Co.

Mr. Clark described the entire process in detail, and illustrated his remarks with some excellent slides. Dr. Langenberg added some remarks on centrifugal casting in general, comparing that of pipe to that of gun parts at Watertown Arsenal. He also spoke of the annealing of such castings. The discussion that followed was devoted largely to the application of the centrifugal process to other products.

Following the technical session, the group gathered about the luncheon table and shared a delicious luncheon furnished by the Philadelphia Electric Co. Mr. George Whitwell, vice president in charge of sales of that company, talked of their part in the steel industry and their interest in the A.S.S.T.

The line then formed at the cloak room as the members gathered hats and coats for the afternoon inspection of the Philadelphia Navy Yard. Busses for the party drew up at the club door, and surrounded by an escort of Philadelphia's finest, proceeded to League Island.

There they were met by a squad of officers who divided up the party and took each group off on its designated route. The main feature of the inspection trip was the Naval Aircraft Factory where planes of all sizes and descriptions were in process of manufacture. The foundry, forge, and machine shops were also inspected. The tour ended with a visit to the battleship New Mexico which is in course of moderniza-

Continued on Page Two

PITTSBURGH CHAPTER STUDIES NITRIDING AT MAY 7 MEETING

W. J. Merten Gives Excellent Talk

By H. L. Walker

The May meeting of the Pittsburgh chapter was held on May 7 at the Keystone Athletic Club. The dinner was followed by a coffee talk on "dope."

W. J. Merten, metallurgical engineer for the Lyon Corporation, Asbury Park, N. J., who was formerly with Westinghouse, later spoke on "Nitriding of Special Steels."

His talk opened with a brief history of the nitriding process and continued into a discussion of theoretical considerations involved. Mr. Merten then covered the present uses and applications of the process, showing some of the changes and advances in design made possible by the application of nitriding.

A brief description and discussion of the equipment used, the furnaces, containers and methods of piping ammonia, was followed by a discussion of nitriding practice which touched upon the manufacture of nitriding steels. Mr. Merten also explained methods of denitriding and of selective nitriding and presented pertinent data. He closed his talk by describing physical properties of nitrided steels and by outlining the testing and inspection methods.

TWO SPEAK AT MAY CLEVELAND MEETING

Ray Rolf and W. T. Donkin are the Featured Speakers

By W. E. Benninghoff

About 50 members and guests attended the dinner preceding the regular May meeting, R. B. Coolidge, of the Aetna Life Insurance Co. gave the coffee talk, a humorous talk on "Most Anything," but underlying his stories and witty remarks was a serious vein dealing with present business conditions.

We then adjourned to the Engineering Society rooms, where two local members of the A. S. S. T. were introduced to 100 members and guests as the speakers of the evening. The introduction was a mere formality because Ray Rolf, Columbia Axle Co., and Bill Donkin, Cleveland Wire Spring Co., were the speakers.

Mr. Rolf spoke on the "Features of Front Wheel Drive." He sketched the development of automobiles, starting with the ancient "sail wagons" and continuing through "steam carriages" down to the present day front wheel drive automobile. The chief advantages of the modern front wheel drive were then illustrated, and the mechanical details described. The design and material used in the various parts were given in full detail.

Mr. Rolf then described the various tests used on the parts of the front wheel drive. The photoelastic method for use on stress in parts, the wear and breakdown tests, alignment tests for parts under various loadings, four square tests on axles and differentials were all outlined. He emphasized the need of service tests in addition to the laboratory tests due to other factors entering into the operation of the parts under test.

Continued on Page Two

SEPTEMBER REVIEW WILL GIVE WHOLE STORY OF BOSTON SHOW

No Issues During July or August

As announced in the last issue, the REVIEW will not be published during July and August owing to the cessation of most of the chapter activities during the summer months.

In September, however, the REVIEW will be published as the METAL CONGRESS REVIEW, an edition of sixteen or more pages devoted to imparting all available information on the National Metal Congress and Exposition which will be held in Boston, Sept. 21-25.

Reduced rate railroad certificates and lists of available preprints will be mailed to every member in August.

Reports of chapter activities received during the summer will be published in the September REVIEW and the opening of the chapter seasons in the fall will be duly recorded in later issues of the newspaper.

CHICAGO A. S. S. T. MAN IS HONORED

David Levinger, engineer of manufacture for the Western Electric Co., has been elected a director of the company. Mr. Levinger, who is a member of the Chicago chapter of this Society, at the age of 44 becomes the youngest member of the Western Electric board of directors.

THE REVIEW

Devoted to the interests of the American Society for Steel Treating

A Review of the Activities of the Chapters and National Organization of the A. S. S. T.

Published monthly except July and August by the AMERICAN SOCIETY *for* STEEL TREATING 7016 Euclid Ave., Cleveland, O.

J. M. WATSON, *President*
A. ORAM FULTON, *Treasurer*
R. G. GUTHRIE, *Director*
B. F. SHEPHERD, *Director*

A. H. D'ARCAMBAL, *Vice-President*
W. H. EISENMAN, *Secretary*
F. B. DRAKE, *Director*
O. E. HARDER, *Director*

W. B. COLEMAN, *Director*

Subscription $.60 a year; 5 cents a copy.

RAY T. BAYLESS ..... *Editor*
JOHN G. MAPES ..... *Managing Editor*

Volume II **Cleveland, O., June, 1931** **No. 6**

American Society for Steel Treating
BALANCE SHEET
As of March 31, 1931

ASSETS			
CASH			
Petty Cash Fund	$ 100.00		
Cleveland Trust Co. (Commercial Acct.)	23,544.04		
Savings Accounts	22,526.38		
		$ 46,170.42	
SECURITIES			
U. S. Government Bonds	$ 27,689.70		
Other Securities	99,196.38		
Accrued Interest	637.92		
		127,524.00	
Accounts Receivable	$ 15,835.60		
Less—Allowance for Doubtful Accounts	151.42		
		15,684.18	
Inventory		10,432.61	
Metal Progress Inventory		2,957.02	
Travel Advances		3,221.37	
Insurance Premiums Prepaid		644.97	
Office Furniture and Fixtures		4,980.75	
1931 Convention Deferred Expense		3,859.05	
Total Assets			$215,474.37
LIABILITIES, RESERVES AND SURPLUS			
Apportionment of Dues to Chapters		$ 10,941.44	
Reserves		45,200.00	
1931 Convention Advance Receipts		1,855.00	
SURPLUS			
January 1, 1931	$140,061.93		
Plus—Excess Income from operating statement for period from Jan. 1 to March 31, 1931	17,416.00		
		157,477.93	
Total Liabilities, Reserves and Surplus			$215,474.37

UNAUDITED INCOME AND EXPENSE STATEMENT
For the period from January 1 to March 31, 1931

INCOME			
Membership Dues	$ 50,275.59		
Sustaining Exhibit Membership	750.00		
		51,025.59	
Less—Apportionment of Dues to Chapters		22,040.72	
			$ 28,984.87
Metal Progress			25,955.13
The Review			15.40
Bound Transactions Sales			3,205.97
Reprints			1,801.10
Bindery			287.50
Books Purchased			103.17
Books Published			540.30
National Metals Handbook			324.17
Pencils, Pins and Buttons			3.00
Extension Division			5,415.00
Western Metal and Machinery Exposition			25,425.92
Interest Earned		$ 310.23	
Discount Earned		216.47	
Sundry Income		117.66	
			644.36
Total Income			$ 92,705.89
EXPENSE			
Support of Chapters			315.79
Metal Progress			24,226.32
Bound Transactions			9,693.74
The Review			709.89
Reprints			1,263.12
Bindery			19.70
Books for Library			28.12
Books Purchased for Resale			36.08
Books Published			795.50
Metal Progress Binders for Resale			24.73
National Metals Handbook			2,280.32
Extension Division			3,054.85
1931 Convention Deferred Expense	$ 3,859.05		
Western Metal & Machinery Exposition			22,083.60
Recommended Practice Committee			850.76
National Committees—Publications			.66
Directors Expense			73.00
President's Office			218.66
Treasurer's Office			1,510.34
Secretary's Office			4,069.16
General Expense			4,035.55
Total Expense			$ 75,289.89
Excess Income Over Expense			$ 17,416.00

Bulletin No. 1 of the International Nickel Company, New York City, describing the S. A. E. system with specifications for chemical composition and inspection standards for carbon and alloy steel, has been revised and is now issued as Bulletin No. 1A, and may be obtained from the company's executive offices, 67 Wall Street, New York City.

* * *

Brown Instrument Co., Philadelphia, is offering to executives copies of a new catalog No. 1101 which features the new line of potentiometer pyrometers recently introduced by the company. The catalog contains 48 pages and is fully illustrated.

B. F. Sturtevant Co., Hyde Park, Boston, has published a new catalog No. 377 describing the Sturtevant unit ventilator and its function in modern ventilation in the industrial plant.

* * * *

Westinghouse Electric and Manufacturing Co., announces leaflet 20477, covering dual drive exciter sets from 25 to 500 K. W. capacities.

* * *

Copies of the new Aluminum Company of America booklet, "Alcoa Aluminum Die Castings," may be obtained from the Pittsburgh offices of that company.

WATERHOUSE RANKS METALLURGY HIGH

Is Speaker at Springfield's Educational Meeting in May

By Geo. H. Glynn

The Springfield chapter met on May 11. As it was an educational meeting, the pupils of the Technical High School and Vocational School were invited to attend.

The speaker for the evening was Dr. G. B. Waterhouse of the department of mining and metallurgy at the Massachusetts Institute of Technology. Dr. Waterhouse spoke on "The Relation of Metallurgical Education to Industry."

"If one but stops for a moment and considers modern improvements in all lines he will realize the large part that metallurgy has played in our present civilization," Dr. Waterhouse said.

"In the field of transportation we have the railroads connecting all the main points, supplemented by automobiles, trucks and busses to take care of movements on land. On and under the water we have our boats and submarines, while for the last of the elements to be conquered by man, the air, we have airplanes and airships. These our present means for the transportation of men and goods would never have reached their high degree of efficiency without the aid of the science of metallurgy."

Our modern buildings and bridges, and our equipment for the efficient production and transmission of electrical power are possible because of the accompanying development of suitable metals.

Formerly the metallurgist was concerned chiefly with the refining of ores, while to-day his task embraces the production of metals and alloys and determining their properties.

Metallurgical courses like other engineering courses in our university are based on a knowledge of chemistry, physics and mathematics. These three subjects constitute the main part of the first two years. The last two years are spent on various aspects of metallurgy and its practice. The last year may be devoted to specialization of one particular branch of metallurgy.

The opportunities afforded to the men properly equipped are manifold. A man may go into the operating end, the sales department or research, and Dr. Waterhouse stated that the demand has constantly exceeded the supply.

THUM SPEAKS ON TESTING

Continued from Page One

load and then at a load slightly under the required elastic limit. A return to the small load should then show but little change from the original reading.

Serviceability tests are more difficult to make and it is generally impossible to duplicate service conditions. No satisfactory short time tests have been developed to determine resistance to wear, corrosion, or fatigue. A desirable test would be one which would determine the degree of file hardness of a surface. Tests are frequently made which are not suitable for service conditions such as tensile tests on columns designed to take pressure.

Mr. Thum discussed the possible causes of failure of the heat treated wire in the Mount Hope Bridge and the Ambassador Bridge in Detroit. Wires were found broken which were stressed only from 10,000 to 32,000 pounds per square inch while the specified strength was 225,000 pounds per square inch. Very rigid tests given the original wire showed it to be satisfactory. The steel uesd was basic open hearth (.80% carbon, .40% manganese) cold drawn from ¼ inch to .192 inches in diameter in one pass. The wire was normalized, oil quenched, tempered in lead, pickled in H_2SO_4 and galvanized.

Failures occurred at the end fasteners where the wires were bent around shoes and at the suspender clamps. At the ends the wire was bent around smaller sheaves to give a good fit on the shoes and was therefore stressed beyond its elastic limit for a short length. Several possibilities were mentioned as possible causes of failure including hydrogen embrittement from pickling, surface defects, lack of permanence of heat treatment, the use of basic steel, the drawing of the wires, etc. All were discarded in favor of the theory that heat treated wire of eutectoid composition is incapable of withstanding slowly increasing stresses after having been previously stressed beyond its elastic limit. The wire broke without reduction of area and it was mentioned that a crystalline material does not retain its toughness at the root of a crack while fibrous material does.

The conclusion arrived at is that there is more to metal than the ability to pass a specified test.

TRI-CITY MEN END SESSION

J. A. Comstock Talks on Carburizing at Final Meeting, Held May 5

By Geo. A. Uhlmeyer

The final meeting of the season for the Tri-City chapter of the A. S. S. T. was held on May 5 in Davenport. Entertainment was furnished during the dinner, which was followed by a business meeting.

The talk for the evening was presented by John A. Comstock, metallurgist for the Peoples Gas Light & Coke Co., Chicago. Mr. Comstock's talk was concerned with carburizing with gas and the effects of furnace atmosphere.

He recounted the latest practices and the recent developments in this method of heat treating and explained various problems which occur in connection with the process.

R. A. BULL TALKS AT NORTHWEST BANQUET

Tells How to Get Most Value from Use of Steel Castings

By A. C. Forsyth

The annual banquet of the Northwest chapter was held in Minneapolis, and was well attended. The business meeting immediately followed the banquet and new officers were elected for the year 1931-32. The arrangement committee provided a very good banquet and entertainment.

Major R. A. Bull, director of the Electric Steel Founders' Research Group, gave the principal address of the evening, on factors to be remembered in getting the most out of steel castings. The speaker first took up the problem from the standpoint of the designer who first gives specifications to the article under consideration. If this article must be tough then some form of ferrous alloy should be used.

Major Bull then continued by making comparisons in compositions, properties and treatments and pointed out that each job must be considered independently before the proper conclusions could be drawn. He also mentioned standard specifications and stated that the average properties of steel castings were much above the standards given and that those specifications are only used for rejection.

The speaker then considered alloy steel castings, and in his discussion mentioned the very wide range of properties that could be obtained by using different combinations of composition and heat treatment.

Substitution of welded constructed parts for replacing castings was also discussed and here again it was pointed out that toughness must be considered, since it is very difficult, in the open air, to make a weld without oxidizing some of the C, Mn or Si.

Major Bull emphasized the importance of coöperation between the designer and the foundryman and gave illustrations showing where a great deal of money and time could have been saved in cases where designers were not familiar with casting practice.

The lecture was concluded by a number of slides illustrating many factors in foundry practice, a few of which are mentioned—the effect of mass on the structure; the value of fillets; the importance of the proper gate and head; the effect of sand control on the finished casting; and pictures showing chemical equipment, physical testing machines including creep testing equipment for castings used at high temperatures. A general discussion followed.

EASTERN MEN HAVE BIG DAY

Continued from Page One

tion. The laying of the keel of a new 10,000 ton cruiser was also witnessed.

Busses were gain requisitioned, and the party moved back to the Penn Athletic Club. An informal dinner was served in the Ball Room. The speakers' table was graced by the presence of all of the national officers of the Society except one, and by men prominent in the Philadelphia business world.

Mr. Gabriel Heatter of Edgar T. Wards' Sons, and editor of the *Shaft*, delivered the address of the evening. He compared the present condition of the business world to that of the returning soldier in the "Road Back." His talk was enthusiastically received as its timely subject held the interest of all present.

The meeting was further honored by the presence of the Honorable Harry A. Mackey, mayor of Philadelphia. Mr. Mackey made the concluding speech as he expressed the pleasure we had received having so many guests to Philadelphia. There was considerable interest in his description of the work being done to alleviate unemployment.

ONTARIO HEARS T. H. NELSON AT BANQUET

Learns of Action of Corrosion on Chrome-Containing Steels

By John W. McBean

The annual meeting of the Ontario chapter was held in Hamilton on May 8, with about 100 members and friends present. We were fortunate enough to have with us W. H. Eisenman, national secretary. He outlined the present status and plans of the Society and its publications. We also had a brief and interesting talk by John F. Keller, who is giving a course of lectures in Montreal, Toronto and Hamilton.

T. Holland Nelson was the principal speaker of the evening, having for his subject heat and corrosion resistant steels. He covered the field in considerable detail pointing out that one of the principal factors which greatly accelerates corrosion is electrolytic action due to two dissimilar substances which always occur in ordinary carbon steels. Since the microscope shows the purest iron to be practically homogeneous, while even an 0.15% carbon steel has two distinct constituents, we should expect the former to be less subject to corrosion and experiment has confirmed this.

He pointed out that the austenitic material in an 18% chromium, 8% nickel iron may be regarded as not quite stable under cold work, and therefore in the case of local cold work we should have two materials which would tend to produce electrolysis. Heating such a steel to 1200°F. tends to concentrate carbides in the grain boundaries, which are therefore easily eaten away by a dilute solution of sulphuric acid and copper sulphate due to electrolysis.

This material is much more easily worked and welded than one containing chromium without nickel and is therefore better for such uses as architectural work. High chromium steels when welded are very coarse grained and brittle whereas 18-8 is not. He said that in some cases, however, the latter may be dangerous in inexperienced hands. If this is welded or riveted and not heat treated to 1200°F. it will not withstand certain chemicals in solution. This effect was illustrated by slides showing the corrosion.

The speaker brought out the point that no one composition of steel is a panacea for all troubles, but in each case the composition must be modified to suit the conditions. It is of the greatest importance to know the exact materials and conditions and the metal should preferably be tested under working conditions.

CLEVELAND HEARS TWO TALKS

Continued from Page One

Mr. Donkin then took the floor to speak on taking the "bugs" from valve springs. He stated that the reliability of an automobile engine valve spring depends on its design, material, and heat treatment. The spring must be correctly designed, the material must be of the highest quality, and the heat treatment must be correctly performed and controlled. In the matter of design, Mr. Donkin showed mathematically the effect of the torsional modulus of the wire, the number of active coils, the maximum stress and stress range, etc.

Surface defects in the wire play an important part in fatigue life, and it is essential that seams, laps, scratches, pits, transverse marks and other defects be eliminated. The heat treatment on S.A.E. 1360 and Swedish wire springs consists of hardening, quenching and drawing before the springs are coiled, and then a low temperature treatment to relieve coiling strains. However, the best results are obtained on all types of wire used by hardening, quenching and drawing after coiling.

Stresses in springs are calculated under static conditions, whereas the spring is used under dynamic conditions and care in design, heat treatment, and material may not produce a long life spring in service because of higher stresses due to resonance. The solution was to design springs for high frequency so that the destructive resonant points are above the range of camshaft speeds or by so coiling as to effect damping and a constantly changing frequency.

General Alloys Co., Boston, and Fours et Appareils Stein, Paris, have entered into an agreement whereby the French company will manufacture in their plant heat and corrosion resisting nickel chromium castings in accordance with General Alloys formulas, patents and practices. The alloys will be sold under the trade names owned by General Alloys.

CHICAGO SYMPOSIUM IS GREAT SUCCESS

Carburizing is the Topic of Discussion by Chapter Men

By John A. Comstock

The principal speaker at the May meeting of Chicago chapter was L. A. Lindberg of the Lindberg Steel Treating Co., Chicago, who spoke on the work he has been doing on carburizing with oil. His talk was very well received and served as a starting point for a symposium on carburizing which took place immediately following the principal address.

H. B. Knowlton, assistant general superintendent of metallurgical operations, International Harvester Co., served as technical chairman, introducing the various speakers contributing to the symposium and regulating the discussion which followed into the proper channels so that the most good was obtained with his preliminary work.

O. T. Muehlemeyer of the O. T. Muehlemeyer Heat Treating Co., Rockford, spoke on the use of compound for carburizing, and J. A. Comstock of the Peoples Gas Light and Coke Co., supplied information on carburizing with gas. The fourth and last speaker was V. A. Hain, district manager of George A. Hagan Co., who discussed the various types of modern carburizing furnaces with special reference to the continuous type for large production purposes.

From the standpoint of both the attendance at the meeting and the interest shown, the last technical meeting of the year proved a big success and pointed the way to future meetings laid out along similar lines and based upon the idea of a symposium.

EXPLAINS TUNGSTEN CARBIDE TO S. TIER

A. A. Merry Outlines Methods of Manufacture and Use

By W. S. Bennett

The speaker of the May 18 meeting of the Southern Tier chapter was Arthur A. Merry, district manager of the Carboloy Co., who spoke on cemented tungsten carbide, a mixture of cobalt and tungsten carbide. The carbide is made by mixing tungsten and carbon and carburizing in an electric furnace having a hydrogen atmosphere at a temperature of approximately 1500° C.

Then the proper proportion of cobalt is added and ball milled with steel balls, after which a sample is tested for hardness and density. A number of lots that have come up to specifications are then mixed together and a test ingot is made. Preliminary firing is done at 860° to 900° C. After tips or dies have been cut to shape the final treating is done at 1450° to 1525°. All this is done in a hydrogen atmosphere.

Various grades are made which vary in toughness, hardness and abrasion resistance. Mr. Merry also pointed out that care should be taken when grinding and that in using this new material it should be borne in mind that best results are obtained when the machine is designed for the increased speeds and feeds which are possible.

Many materials which were heretofore considered as impossible to machine in a commercial way have been successfully and economically worked by tungsten carbide tools. The material has been most economically used on iron liners for pumps, cylinder blocks, pistons, aluminum castings, die castings, brass, bronze, rubber, bakelite and many other materials including drills for glass, slate, stone.

FORM GENERAL METALS CORP.

Group of West Coast Metal Plants Was Formerly "Consolidated Foundries"

The General Metals Corp. is the new name of the Pacific Coast group formerly known as Consolidated Foundries. Executive offices of the General Metals Corp. are now at 485 California St., San Francisco.

The Foundry division of the corporation consists of the Best Steel Plant, the Best Iron Plant, and the Pacific Malleable Plant, all of Oakland; the Jewell Plant at San Francisco and the Western Malleable Plant in Los Angeles. Forgings are handled by the Western Drop Forge Plant and the Western Press Forge Plant at Los Angeles. The California Wheel Plant at Oakland is a member of the Machine division.

N. HAVEN MEMBERS ASSEMBLE FOR ANNUAL MEETING, MAY 22

C. H. Davis Gives Technical Talk

By F. J. Dawless

The annual meeting of the New Haven chapter was held on May 22 at Bridgeport, Conn. The business meeting was preceeded by a dinner served at the University Club and attended by about twenty-five members of the chapter.

Reports of the year's activities were submitted by Fred Stockwell, secretary, Walter Aurand, treasurer; Harold Fish, fellowship chairman; Fred Dawless, program chairman, and Henry Keshian, chairman. The secretary's report indicated an average attendance at meeting of approximately one hundred.

H. G. Keshian reviewed briefly the year's work and expressed his satisfaction with progress made and appreciation for the coöperation of the chapter.

C. H. Davis, assistant metallurgist of the American Brass Co. gave a most interesting and instructive talk on the relation of structure to physical properties of some non-ferrous alloys. The lecture was splendidly illustrated by slides and was followed by a lively question period.

DAYTON MEN ENJOY X-RAY DISCUSSION

Hear C. A. Poole Describe Rays as Test and Research Tool

By Geo. R. Long

The April meeting of the Dayton chapter was held at the Engineers Club on April 20. The dinner was followed by a coffee talk on the, "Use and Abuse of Twist Drills." A movie was shown through the courtesy of the Cleveland Twist Drill Co.

The feature of the evening was a talk on, "The Use of X-Ray on Metals," by C. A. Poole, research engineer of the Kelly-Koett Mfg. Co. The speaker touched mainly on the use of X-Ray for discovering flaws, but also mentioned diffraction methods and the type of information available from these sources. The advantage of X-Ray for testing is that the method is non-destructive and gives a picture of the entire piece, rather than local as destructive sectioning does.

It may be used as a pilot test in determining the factors involved in a casting process. This may then be followed by occasional examination. On the other hand, it is possible to place it in the production line as a 100 per cent inspection tool. Examples of blowholes, cracks, inclusion, etc., were shown by slides. The use of X-Ray for examination of welds, has also proven valuable as it shows unsoundness, lack of fusion, and other defects.

In the diffraction method a study can be made which gives valuable information relative to grain size, crystal orientation, and degree of strain or cold rolling. In connection with annealing operations, the X-Ray has been used to determine the annealing time. The usefulness of X-Rays in this connection has merely been demonstrated and it remains for future research to develop the many fields which are available.

This interesting talk was brought to an end only after numerous questions had been brought up.

TALK ON FATIGUE OF METALS FEATURES COLUMBUS MEETING

R. E. Peterson Is May Speaker

By L. H. Marshall

The Columbus chapter's final meeting of the 1930-31 season was held at the Battelle Memorial Institute on May 12. Being the annual business meeting, the technical session was preceded by the reports of the treasurer and the nominating committee.

The speaker for this meeting was R. E. Peterson of the Westinghouse Electric and Manufacturing Co. who talked on fatigue of metals. The subject was ably discussed by Mr. Peterson who has been identified with extensive research in this field. He described the various types of fatigue testing machines, pointing out their merits and defects. A number of the factors affecting fatigue test results were discussed. The rate of stress reversal and size of specimens, for instance, have some influence on results but are not as important as the surface finish of the specimen under test.

Mr. Peterson gave a thorough resume of the subject.

BIG FORGINGS HOLD HARTFORD INTEREST

J. R. Adams Discusses Forging of 485,000-lb. Ingots

The Hartford chapter was treated to a very interesting illustrated description of the production of large forgings at their meeting May 12, presented by J. R. Adams, superintendent of the special products division of the Midvale Co.

Mr. Adams' talk covered a class of work which is seldom seen, covering the field of hammer and press forging of ingots as large as 485,000 pounds. In discussing hammer forgings he said that the size of forging which can be effectively worked is limited due to the sharp, instantaneous force applied which does not penetrate deeply enough to refine the structure at the center of large pieces.

Thin discs of large diameter, such as steam turbine bucket wheels, are readily made under the hammer. A 25,000 pound disc 20 inches thick can be forged down under the hammer to 3" to 4" thick with ease.

Most large forgings are to-day made under the hydraulic forging press, as the slow application of force enables a small press to make forgings of a size that would require an enormous hammer and the center of a large forging is better worked by a press than by a hammer. Octagon ingots 108" across and weighing 485,000 pounds are being successfully cast and forged under the press and rectangular ingots of the same weight can be handled. Although the press is not well adapted to form thin upset discs it is admirable for upsetting, punching, and trephining very large pieces and is a better tool than the hammer for drawing long drums.

Great care must be taken in controlling the pouring and in design of the mold for casting the ingots to eliminate shrinkage cavities and blow-holes. Large ingots should be stripped while still hot and be allowed to cool slowly through their critical range and then be reheated for forging. If the ingots are to be stored it is advisable to break up the coarse crystalline structure by a small amount of rough work and then to give them an annealing treatment.

A 63-in. octagon ingot would be brought to the forging temperature in not less than sixty hours and then soaked for twenty-four hours before forging. Longer time would be allowed for alloy ingots or compositions that are tender and difficult to forge.

The finishing temperature of forging should be as low as practicable for high physical properties are difficult to obtain by subsequent heat treatment if the finishing temperatures are too high. Larger allowances for finish machining are required by press forgings than for hammer forgings because the former method, lacking the impact effect for removing scale, may press the scale into the forging.

Experience has led to the practice of continuously rotating a long forging while it is being reduced rather than to forge from end to end without rotating.

Among the interesting forgings shown were a huge single-throw crankshaft of 90,000 lbs.; 16-in. naval guns, 96 ft. long heated in a vertical furnace and quenched in water; and steel rolls 72,000 lbs. in weight with a scleroscopic hardness of 87 to 91.

NEW JERSEY PAYS HONOR TO SUSTAINING MEMBERS MAY 4

Over 300 Turn Out for Meeting

By D. H. Sheridan

New Jersey chapter held its Annual Sustaining Member's Night on May 4. A most excellent dinner was served to a gathering of 192 members. This number was later augumented to 300 odd members and guests.

The coffee talk was given by Dr. O. E. Harder assistant director of the Battele Memorial Institute, Columbus. Dr. Harder's subject was the "Value of Research to Industry."

The speaker told us that $19,000,000 is spent annually for research, 85% of which is expended by an industry employing only some 35,000 persons. This means that research is paying dividends. The metal industry is the second largest in research, spending 2.1% of the total investment yearly. Dr. Harder pointed out that research was in its infancy despite this large expenditure.

Mr. Edward W. Stearns, assistant chief engineer of the Port of New York Authority gave an illustrated lecture on the new George Washington Bridge which spans the Hudson River. The reels depicted the construction of the bridge from its beginning—a truly remarkable achievement.

NORTHWEST ENJOYS TALK ON METHODS OF CARBURIZING

H. E. Koch is Speaker in April

By A. C. Forsyth

H. E. Koch, research engineer for the Hevi-Duty Electric Co., Milwaukee, was the speaker at the April meeting of the Northwest chapter.

Mr. Koch first recalled a few interesting points concerning the early history of carburizing, dealing especially with different kinds of gas carburizing methods. The speaker then discussed the various sources of gas and gave many interesting facts concerning the source of carburizing gases and the dependability of each. Gas carburizing has the advantage of being constantly under control, that is, the charge can be brought to temperature before carburization starts and can likewise be controlled during cooling, giving good gradation by diffusion.

Mr. Koch also discussed carburization installations and pointed out many important features which ought to be considered in selecting a unit. Nitriding was considered particularly with respect to furnace design and catalytic agents for increasing the speed of nitriding. The lecture was illustrated by many interesting slides and followed by a discussion.

INDIANA MEN HEAR FACTS OF BUTANE

F. J. Harlow Tells Chapter of Place of Gas in Industry

By A. E. Focke

The May meeting of the Indianapolis Chapter was held in the Hotel Severin, Monday evening, May 25, 1931.

Our genial national secretary, "Bill" Eisenman, told us some interesting facts about the Western Metal Congress and gave us some preliminary information on the Boston show. His report of the success of *Metal Progress* was very encouraging.

F. J. Harlow, manager, industrial division of the Philfuels Co., gave a well prepared and extremely informative talk on butane.

Mr. Harlow showed that butane was not a new material but was actually as old as the petroleum industry. The Philfuels Co. have arranged transportation facilities for this gas and they are now attempting to determine its logical place in industry.

The supply of butane is sufficient to fill the requirements of 20 cities the size of Chicago but Mr. Harlow pointed out that no competition with manufactured or natural gas for domestic use is contemplated. The intention is to supply industrial requirements.

His presentation of the fact that in one case 110 sheet metal nichrome carburizing boxes operating in a butane-fired furnace had given 7000 hours service and still appeared as new as the day they were started, was important to those of us who are familiar with the effect of the sulphur in fuel oil.

LEHIGH MEN, ENGINEERS CLUB OF READING, MEET TOGETHER

F. R. Palmer Talks on High Speed

By G. V. Luerssen

A joint meeting of the Lehigh Valley chapter and the Engineers' Club of Reading was held in Reading on April 10. The speaker of the evening was F. R. Palmer, a past chairman of the chapter. Mr. Palmer's talk covered some practical suggestions pertaining to the heat treatment of high speed tool steel. Three definite points were covered in Mr. Palmer's talk.

The first of these had to do with the sluggishness of the transformations in high speed steel, and Mr. Palmer pointed out in his lucid manner the necessity for cooling to a sufficiently low temperature in quenching before transferring the tools to a drawing bath.

The second point had to do with the formation of fish scale fracture in high speed steel and in this connection Mr. Palmer showed some very interesting slides illustrating the effects produced by double quenching.

The third section of the talk covered the pack-hardening of High Speed steel, an extremely interesting development in the art of heat treating.

The meeting was preceded by the usual dinner meeting of the Executive Committee, which was held at the Wyomissing Club, Reading.

BOSTON MEN VISIT PLANT, HEAR TALK

Guests of U. S. Shoe Machinery Corp., Hear Dr. Homerberg

By Howard E. Handy

Through the courtesy of G. C. Thomas, vice-president and manager of the United Shoe Machinery Corp., about 200 members and guests of the Boston chapter visited the Beverly Plant of the company on May 1. Registration started at 1:30 P. M. and during the following three hours the visitors were conducted through the drop forge shop, gray-iron and brass foundries, raw and finished stores, hardening room and the die-bending departments. Those who were interested also had the opportunity of inspecting the extensive machine shops and tool rooms.

Following the visitation the party assembled at the beautiful Country Club of the United Shoe Machinery Athletic Association where Major Charles T. Cahill, sales engineer, gave a half-hour's illustrated talk on the traditions and romance of shoes, reviewing the ancient and modern types of shoes, together with the methods used in making them. The talk was concluded with a series of pictures showing the different machines now marketed by the corporation for the manufacture of shoes and other leather products.

Dr. Waterhouse introduced the president of the Athletic Association who, in the absence of Mr. Thomas, gave a few words of welcome after which the speaker of the evening, Dr. Victor O. Homerberg, associate professor of physical metallurgy at Massachusetts Institute of Technology, and director of the Nitralloy Institute, New York, was introduced. Dr. Homerberg, who is well known to all Boston members, having been chairman of the Boston chapter in 1924 and a frequent speaker at its meetings, presented the latest developments in "Nitriding" which were extremely interesting to those who are doing nitriding and also to those who have use for nitrided parts.

A lengthy discussion was followed by a rising vote of thanks to Dr. Homerberg and also to E. L. Bartholomew, metallurgist for the United Shoe Machinery Corp. and an officer of the Boston chapter, who was in general charge of the day's program.

ROCKFORD STUDIES TUNGSTEN CARBIDE

F. W. Curtis is Main Speaker; Tantalum Carbide Discussed

By C. B. Sadtler

The Rockford chapter concluded its season's activities with two lectures on the subject of tungsten carbide and kindred materials. The main lecture, under the title of "Metal Cutting with Tungsten Carbide," was given by Frank W. Curtis, research engineer of the Kearney & Trecker Corp., Milwaukee.

Mr. Curtis covered in detail the progress which has been made in utilizing tungsten carbide on a large variety of machining operations, many of which were accomplished by milling machines of radically different design than those used with older type cutters. From the descriptive matter, lantern slides, and motion pictures, the extent to which changes had been instituted was strikingly brought out, not only in the milling machines themselves, but also in the details of construction of the cutters, which had, for the greater part, inserted teeth which were tipped with tungsten carbide. The most valuable application of tungsten carbide is in machining cast iron, non-ferrous materials of quite wide variety, and also a large number of non-metallic materials.

Guy Jaconelli, district manager of Arthur A. Crafts & Co., Chicago, discussed a number of special tungsten carbide tools and laid emphasis on some of the highly refined lapping methods, which were often necessary, and for which purpose diamond dust has, up to the present, been used exclusively.

He pointed out that the newer material in this class, tantalum carbide, had been used successfully in a sufficient variety of applications to warrant the prediction that it will permit of approximately the same increase in speed of metal removal in steel, which tungsten carbide has made possible in the case of cast iron. Considerably more development work will probably be necessary, however, before the detailed knowledge of the proper use of tantalum carbide is gained.

OFFICERS AND EXECUTIVE COMMITTEEMEN OF THE CHAPTERS

Below are given the officers and executive committees of the various chapters of the society. Some chapters have not yet elected new officers, but the list below presents the officials of every chapter according to information at National Headquarters on June 10, 1931.

Boston Chapter

A. D. Bach, New England Metallurgical Corp., chairman; E. B. Ashworth, Bethlehem Shipbuilding Corp., vice-chairman; H. E. Handy, 48 High St., Saco, Me., secretary-treasurer. Executive Committee: E. L. Bartholemew, E. N. Downing, J. L. Faden, F. P. Flagg, L. D. Hawkridge, J. A. Johnston, W. J. Kunkel, W. K. Leach, H. B. Parker, G. B. Waterhouse, and Maurice Winn.

Buffalo Chapter

J. H. Birdsong, Pratt & Letchworth Co., chairman; J. Robert Eves, 660 Grant St., vice-chairman; Clyde Llewelyn, 149 Potter Rd., secretary; C. F. Wahl, Pratt & Letchworth Co., treasurer. Executive Committee: A. E. Batzell, Alex L. Feild, W. L. Harbrecht, J. W. Petrie, W. H. Wills, and E. F. Wilson.

Canton-Massillon Chapter

R. G. Roshong, Hoover Co., chairman; Robert Sergeson, Republic Steel Corp., secretary-treasurer. Executive Committee: M. A. Grossmann, W. M. Farnsworth, F. L. Cavender, T. D. Hayes, W. Hildorf, John Alden, W. M. Lindsey, L. D. Gable, R. W. Thompson, and R. L. Wilson.

Chicago Chapter

Donald Colwell, Stewart Die Casting Co., chairman; Harry Hardwicke, Ludlum Steel Co., vice-chairman; John A. Comstock, Peoples Gas Light and Coke Co., secretary-treasurer. Executive Committee: E. C. Blocks, Jr., A. F. Christian, B. J. Hammerly, H. B. Knowlton, L. A. Lindberg, W. Mathesius, R. M. Sandberg, J. Secor, A. W. Sikes, and L. H. Whiteside.

Cincinnati Chapter

R. O. McDuffie, University of Cincinnati, chairman; N. C. Strohmenger, Tool Steel Gear & Pinion Co., secretary-treasurer. Executive Committee: H. S. Binns, G. M. Enos, E. F. Ries, N. M. Salkover, Ralph Flohr, and Anthony Lucas.

Cleveland Chapter

W. T. Donkin, Cleveland Wire Spring Co., chairman; W. E. Benninghoff, Cleveland Illuminating Co., vice-chairman; H. B. Pulsifer, Ferry Cap & Set Screw Co., secretary-treasurer. Executive Committee: James Ayling, M. L. Burchfield, H. P. Croft, C. L. Harvey, A. F. Moranty, J. S. Nicholas, E. F. Ross, and H. Vlchek.

Columbus Chapter

J. O. Lord, Ohio State University, chairman; L. S. Colby, E. F. Houghton & Co., vice-chairman; L. H. Marshall, 168 Clinton St., secretary-treasurer. Executive Committee: R. H. Frank, O. E. Harder, W. D. Kramer, G. D. Moessner, G. N. Moffatt, N. W. Stevens, and W. A. Welcker, Jr.

Dayton Chapter

F. L. Meacham, Frigidaire Corp., chairman; F. M. Reiter, Dayton Power & Light Co., secretary-treasurer. Executive Committee: C. E. Mentel, Jr., George R. Long, Wm. M. Duke, B. H. Stenger, A. B. Beaver, Geo. W. Elsey, H. E. Flanders, and E. D. Brauns.

Detroit Chapter

H. W. McQuaid, Timken-Detroit Axle Co., chairman; C. J. Tobin, General Motors Research Laboratory, vice-chairman; Gordon Webb, Ryan, Scully & Co., secretary-treasurer. Executive Committee: B. B. Beckwith, E. G. Brick, Glenn Coley, W. B. Crans, L. C. Dunn, John Harding, E. G. Peckham, J. W. Robinson, James R. Ross, Clifford Snyder, and Wm. P. Wood.

Fort Wayne Chapter

E. Stirnkorb, 332 Packard Ave., chairman; W. A. Muller, Northern Indiana Public Service Co., secretary-treasurer. Executive Committee: J. H. Clark, Nestor Fries, E. J. Trier, J. G. Brown, and Jos. Doepker.

Golden Gate Chapter

Myron Bird, California Saw Works, chairman; Howard S. Taylor, Stanford University, vice-chairman; R. S. Hirst, 2429 Haste St., Berkeley, secretary-treasurer. Executive Committee: W. J. Crook, F. B. Drake, Joseph Eastwood, S. H. Edwards, John Fowler, D. Hansen Grubb, Horace L. Hirschler, W. Holzhauer, Ivan Johnson, Oscar Malmquist, G. A. Nelson, and E. A. Wilcox.

Hartford Chapter

H. I. Moore, Firth Sterling Steel Co., chairman; J. H. G. Williams, Henry Souther Engineering Co., vice-chairman; L. H. Knapp, Hartford Electric Light Co., secretary-treasurer. Executive Committee: James Allison, W. H. C. Berg, Ralph F. Casella, J. H. Coyle, H. J. Fischbeck, Edmund S. Gardner, Ralph Hare, John P. Howley, Leonard Lindberg, E. A. Sanford, Harry E. Simpson, James S. Skinner, and H. W. Staples.

Indianapolis Chapter

E. S. Moore, J. D. Adams Mfg. Co., chairman; R. J. Owen, 1120 E. 23rd St., vice-chairman; A. E. Focke, Diamond Chain Mfg. Co., secretary; Axel Weydell, Diamond Chain Mfg. Co., treasurer.

Lehigh Valley Chapter

H. V. Apgar, 908 Northampton St., Easton, chairman; Walter L. Trumbauer, Bethlehem Steel Co., Bethlehem, vice-chairman; L. F. Witmer, Lafayette College, Easton, secretary-treasurer. Executive Committee: H. Gifford, O. V. Greene, W. E. Harvey, A. C. Jones, H. Paulus, Leon Scheifele, A. D. Shankland, A. P. Spooner, and J. M. Weil.

Los Angeles Chapter

W. A. De Ridder, General Metals Corp., chairman; T. S. Hutton, Box 58, Sta. K, vice-chairman; Donald C. Miller, Braun Corp., secretary; Chester H. Dye, treasurer. Executive Committee: Lee Bergstrom, E. E. Fess, G. M. Gilmore, Earle M. Jorgensen, James H. Knapp, R. S. Smith, and J. H. Spade.

Milwaukee Chapter

F. A. Hansen, Hevi Duty Electric Co., chairman; Frank Kubosch, Thurner Heat Treating Co., secretary-treasurer. Executive Committee: Ray Thiesenhusen, M. G. Jewett, T. H. Cochrane, W. G. Hanawalt, M. H. Disch, J. Houston, A. E. Rauch, C. F. Scheid, and R. N. Hurless.

Montreal Chapter

Robert J. Noakes, 25 St. Antoine St., chairman; C. E. Herd, Dominion Engineering Works, vice-chairman; Duncan G. MacInnes, 4992 Earnscliff Ave., secretary; W. M. Baxter, Crane Co., treasurer. Executive Committee: F. R. Barnsley, W. J. Brown, P. H. Desrosiers, E. J. Durkin, F. O. Farey, W. J. Hall, T. W. Hardy, F. A. McKay, R. B. Norton, David Robertson, J. K. Schofield, G. W. Scott, and J. M. Scott.

New Haven Chapter

F. J. Dawless, P. O. Box 1448, chairman; W. G. Aurand, R. Wallace & Sons Mfg. Co., Wallingford, vice-chairman; F. E. Stockwell, Colonial Beacon Oil Co., secretary-treasurer. Executive Committee: B. T. Baker, R. L. Baldwin, Roy Card, P. L. Clark, J. C. Nelson, A. Phillips, R. T. Porter, and S. C. Spalding.

New Jersey Chapter

John F. Wyzalek, Hyatt Bearings Division, General Motors Corp., Harrison, chairman; A. M. McWilliams, J. McWilliams & Son, Jersey City, vice-chairman; John H. Johnson, 345 Mountain Ave., Springfield, secretary; R. W. Thorne, 369 North Grove St., East Orange, treasurer. Executive Committee: C. S. Cronkright, Frank A. Elshoff, W. R. Fraser, W. H. Hall, James H. Heath, H. H. Hornbruch, H. D. McKinney, James B. Mudge, P. C. Osterman, and E. L. Roff.

New York Chapter

J. J. Crowe, Air Reduction Co., chairman; E. M. Wise, International Nickel Co., vice-chairman; T. N. Holden, E. W. Bliss Co., secretary-treasurer. Executive Committee: E. H. Anthes, E. J. Bothwell, M. T. Garlinger, Alexander Gobus, A. B. Kinzel, William Printz, F. T. Sisco, Sam Tour, J. S. Vanick.

Northwest Chapter

A. F. Moyer, Toro Mfg. Co., Minneapolis, chairman; H. S. Jerabeck, University of Minnesota, Minneapolis, vice-chairman; Alexis Caswell, 100 Builders Exchange Bldg., Minneapolis, secretary-treasurer. Executive Committee: H. A. Anderson, Paul Carpenter, G. J. Graham, Thomas O. Hanson, H. J. Kicherer, C. F. Olmstead, Joseph Scandling, and Harold Washburn

Notre Dame Group

Andrew Boyle, chairman; John Bleeg, vice-chairman; Vance Uhlmeyer, secretary; John Hamilton, treasurer.

Ontario Chapter

D. M. Fraser, Peerless Engineering Co., chairman; L. F. Fitzpatrick, Flexible Shaft Co., Ltd., secretary-treasurer. Executive Committee: H. F. Davis, O. W. Ellis, R. M. Hamilton, R. Bradburn, A. Oram, M. F. Verity, A. G. Davis, J. A. Harris, N. P. Peterson, W. O. Oliver, W. D. Fairbrother, J. W. McBean, and R. Potts.

Philadelphia Chapter

Gustav Peterson, Ludlum Steel Co., chairman; A. O. Schaefer, Midvale Co., secretary-treasurer. Executive Committee: J. R. Adams, H. C. Boynton, N. C. Einwechter, W. F. Oberguber, E. B. Estabrook, J. E. Chapin, S. B. Mathews, B. H. Bachman, P. Hurd. A. M. Lindsley, H. E. Parkinson, and C. L. Roth.

Pittsburgh Chapter

E. H. Dix, Jr., Aluminum Co. of America, New Kensington, chairman; S. L. Goodale, University of Pittsburgh, vice-chairman; H. L. Walker, Box 521, N. S. Sta., secretary-treasurer. Executive Committee: A. D. Beeken, Jr., R. E. Dinkey, J. P. Gill, D. J. Richards, and W. R. Valentine.

Rhode Island Chapter

Robert G. Ashman, J. D. Crosby Co., Pawtucket, chairman; Walter M. Saunders, 32 Laurel Ave., vice-chairman; Carl G. Petersen, Providence Gas Co., secretary-treasurer.

Rochester Chapter

R. H. Morris, Davenport Machine Tool Co., chairman; R. F. Kimber, 313 E. Genesee St., Fayetteville, vice-chairman; Irving C. Matthews, Eastman Kodak Co., secretary-treasurer. Executive Committee: H. J. Leclaire, Gerald A. Lux, W. T. Morgan, J. I. Reid, N. L. Saunders, and L. J. Sullivan.

Rockford Chapter

C. B. Sadtler, Barber-Colman Co., chairman; L. J. Strohmeyer, Eclipse Fuel Engineering Co., vice-chairman; H. E. Habecker, Emerson-Brantingham Corp., secretary-treasurer. Executive Committee: S. F. Anderson, Freeman Anderson, Alan Mattison, and R. M. Smith.

Schenectady Chapter

C. B. Templeton, Ludlum Steel Co., Watervliet, chairman; J. G. Hicks, American Locomotive Co., vice-chairman; F. C. Kelley, General Electric Co., secretary-treasurer. Executive Committee: G. R. Brophy, R. H. Harrington, W. D. Kellogg, B. H. Magill, and W. L. Weaver.

Southern Tier Chapter

H. S. Snodgrass, American La France & Fomite Corp., Elmira, chairman; R. B. Baker, Endicott Forge & Mfg. Co., Endicott, vice-chairman; W. S. Bennett, Elmira Water, Light & Railway Co., secretary; J. P. Dickinson, Stowe Mfg. Co., Binghamton, treasurer. Executive Committee: D. M. Cook, L. R. Evans, Norville Jacquay, James Sturrock, Jr., G. M. Thrasher, and N. R. Wickersham.

Springfield Chapter

Wynn Rossiter, 19 Kimberly Ave., chairman; S. F. Cushman, Perkins Machine & Gear Co., vice-chairman; Thomas Jones, Chapman Valve & Mfg. Co., Indian Orchard, secretary-treasurer. Executive Committee: Earl C. Abbe, Jr., T. H. Counihan, V. T. Malcolm, A. L. Shields, and B. B. Tremere.

St. Louis Chapter

R. M. Pease, 3844 Walsh St., chairman; L. T. Clark, A. Leschen & Sons Rope Co., vice-chairman; L. T. Holland, E. F. Houghton & Co., secretary-treasurer. Executive Committee: Edward Pendergast, C. A. Carlson, Lorenzo T. Clarke, E. C. Hanpeter, Wm. J. Ruby, and W. D. Thompson.

Syracuse Chapter

Malcolm E. Cummings, Crucible Steel Co. of America, chairman; S. W. French, 108 Shelbourne Place, secretary-treasurer. Executive Committee: R. L. Manier, Grover Farnsworth, M. E. Cummings, S. W. French, Frank Cannon, C. E. O'Connor, P. W. Eddy, H. I. Thomasmeyer, H. L. Day, and W. J. Hansen.

Tri-City Chapter

R. E. McGee, International Harvester Co., Rock Island, chairman; Garnet Phillips, Franks Foundry Corp., Moline, vice-chairman; Robert H. Lind, Peoples Light Co., Davenport, Iowa, secretary-treasurer. Executive Committee: R. K. Barry, Hyman Bornstein, W. J. Borst, John Fielding, C. F. Scharer, J. W. Slattery, Fred Turner, and George A. Uhlemeyer.

Washington-Baltimore Chapter

R. W. Dietrich, Crucible Steel Co. of America, Baltimore, chairman; L. H. Fawcett, U. S. Naval Gun Factory, vice-chairman; S. J. Rosenberg, Bureau of Standards, secretary-treasurer. Executive Committee: C. E. Margerum, L. Waldron, and H. S. Rawdon.

Worcester Chapter

Milton H. Frommann, Reed & Prince Mfg. Co., chairman; Robert C. Jordan, Wickwire Spencer Steel Corp., vice-chairman; Theodore Packard, American Steel & Wire Co., secretary-treasurer. Executive Committee: R. E. Bigelow, Fred L. Coonan, John R. Crotty, Charles A. Forss, William Hague, C. G. Johnson, John A. King, Neale McNeil, and Donald Strand.

York Group

George J. O'Neill, Pennsylvania Gas & Electric Co., chairman; A. W. F. Green, American Chain Co., vice-chairman; Chas. M. Strickler, General Machine Works, secretary-treasurer. Executive Committee: F. J. Allen, Wm. F. Allen, W. LeC. Harbaugh, H. M. McCort, and F. E. Reiners.

F. COYLE TELLS SPRINGFIELD ABOUT HIGH TEST CAST IRON

Meeting Held on April 23

By Geo. H. Glynn

Frank B. Coyle, research metallurgist of the International Nickel Co., spoke on "Principles of Alloy and High Test Cast Irons" at the April 23 meeting of the Springfield chapter.

Mr. Coyle introduced his subject by defining the various grades of cast iron in terms of their tensile strength. By means of photomicrograph slides he showed how increasing amounts of nickel, and chromium, might change the pearlitic matrix of the iron to austenite. Nickel is added to iron to give it a more uniform structure, increased hardness and wear resistance without impairing the machinability and to increase the strength. Nickel reduces the chilling tendency of cast iron in thin sections as does silicon but it does not open up the grain and therefore impair the strength like silicon. For this reason nickel may be used to supplement the action of silicon.

Chromium is another alloying element which is finding a wider range of application in conjunction with the use of nickel in cast iron. Chromium, like nickel, refines the grain, hardens and strengthens the iron, but, unlike nickel and silicon, increases the chill. Nickel and chromium when used together are employed in the ratio of 2½ to 1.

BOSTON CONVENTION PLANS

Continued from Page One

resisting alloys, and still another to nitriding. In addition to these special sessions, there will be five others in which papers of more general nature will be presented.

To date, sixteen papers have been accepted by the Publication Committee and are being prepared for preprinting. This number is increasing daily as the committee reports on accepted manuscripts.

Pitt Men Visit Aluminum Co. at New Kensington

OFFICERS' REPORTS FEATURE BUFFALO'S ANNUAL MEETING

Average Meeting Attendance 67%

By Charles F. Wahl

The annual dinner of the Buffalo chapter was served to fifty-seven members.

E. F. Wilson, chairman of membership committee spoke of the support he received from members of his committee. The coming year looks very promising with a prospective list of ninety.

We had an average attendance of 67% at the above meetings as against 61% last year. The large attendance was due to J. H. Birdsong, program chairman, in securing the high class speakers. On June 1st, 1930, we had 121 members of whom 14 were sustaining members. During the past year we had a loss of 46 members of whom 4 were transferred to other chapters, 42 resigned or were dropped for non-payment of dues.

ANNUAL MEETING OF YORK MEN IS ADDRESSED BY A. W. F. GREEN

Successful Chapter Year Ended

By George J. O'Neill

Arthur W. F. Green, metallurgist of the American Chain Co., addressed the annual meeting of York group on May 6. His subject was "Mental Surprises." He cited the number of mental surprises the group had met with in the past year, which has been a banner year in growth and in organized activities.

Mr. Green particularly stressed the benefits in way of interesting information such as was presented in a lecture by William F. Allen, chief chemist of the Molybdenum Corp. of America, who spoke on "Tungsten Carbide." Mr. Green declared it to be a mental surprise for the members of the group to learn that there is one in their midst who has at command so rich a fund of up-to-the-minute information on live technical subjects.

Employment Service Bureau

Address answers care of A. S. S. T., 7016 Euclid Ave., Cleveland, unless otherwise stated.

POSITIONS WANTED

YOUNG CHEMIST with ferrous and non-ferrous experience, working knowledge of metallography. Capable of heat treating practice, familiar with electric gray iron control and melting, conversant with permanent mold practice and college graduate. Address 6-20.

GRADUATE METALLURGICAL ENGINEER: Four years experience melting alloy and carbon steels followed by service in metallurgical and inspection departments of large mills. Qualified for sales or metallurgical control position. Address 6-10.

POSITION WANTED—Recent graduate in metallurgical engineering, Case School of Applied Science. Record good. Anxious to start at anything offering experience or future prospects. Address 6-15.

CHEMIST-METALLURGIST: Wide experience, embracing ferrous and non-ferrous industries, Chemical, physical, heat treating, metallography and plant work. Good analyst having developed methods for difficult analysis. Address 6-5.

For Sale: Leitz Micro-Metallograph

We have available at a very attractive price, a slightly used Leitz Micro-Metallograph of recent design, complete with all accessories, guaranteed to be in perfect working condition. Address 4-10.

SALES REPRESENTATIVES

Wanted by conservative firm manufacturing full line of carburizing and metallurgical materials. Only men who have wide acquaintance and following considered. Commissions only. Please state territory covered and record. Address 2-10.